Utilizing Stem Cell-Derived RPE Cells as A Therapeutic Intervention for Age-Related Macular Degeneration.

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Public Summary:

Scientific Abstract:
PURPOSE: Degeneration or dysfunction of the retinal pigment epithelium (RPE) can induce secondary photoreceptor atrophy and catastrophic vision loss in patients with age-related macular degeneration (AMD). AMD is the leading cause of vision loss in the elderly in industrialized countries and no cure exists for the "dry" or atrophic form to date. However, recent pre-clinical data from several groups suggests that embryonic stem cell-derived RPE cell transplantation may prevent photoreceptor degeneration in animal models of RPE degeneration. Another approach may be to derive RPE cells from autologous induced pluripotent stem cells (iPSCs) reprogrammed from dermal tissue. However, the safety of this approach has been questioned on several levels. In this chapter we will summarize work reported by several groups, including our own, that clearly demonstrate that transplanted RPE cells can provide anatomical and functional photoreceptor rescue in animal models of retinal degeneration. We will also discuss some of the prevailing concerns and challenges associated with this technique.